

Climate Change

What to think and what to do

1. Framing Climate Change

We don't inherit the Earth from our ancestors, we borrow it from our children.

Me

- Not an expert! An absolute amateur!
- Studied sciences to A level about a million years ago
 - Worked in IT, law and commerce, now retired
 - Always most interested in logic, rationality and ethics
 - Increasingly interested in the *flaws* in human thinking capabilities
- Personal belief that Climate change is the biggest thing we face
 - Vastly bigger than Brexit, impactful though that was
 - Much bigger than Covid, ditto
 - Not as big as Artificial (General) Intelligence
 - But if we don't fix CC, we won't see AGI!

A few warm-up exercises (1)...

- *“It doesn't matter how many windmills or solar panels or nuclear plants you build if you are not simultaneously retiring fossil fuel production. We need a global programme whose purpose is to leave most coal and oil and gas reserves in the ground, while developing new sources of power and reducing the amazing amount of energy we waste.”*

George Monbiot **2013**

- *“For over 70 years economics has been fixated on GDP, or national output, as its primary measure of progress. That fixation has been used to justify extreme inequalities of income and wealth coupled with unprecedented destruction of the living world. For the twenty-first century a far bigger goal is needed: meeting the human rights of every person within the means of our life-giving planet.”*

Kate Raworth **2017**

- Constructive points, but largely unheeded. So now we have...

A few warm-up exercises (2)...

- *“Climate change is humanity's greatest threat in thousands of years. It could lead to the collapse of civilisations and the extinction of much of the natural world. We are facing a man-made disaster of global scale. This is our last chance.”*

Sir David Attenborough **2018**

- *“It is now indisputable that we are in a climate emergency. Soaring levels of .. greenhouse gases .. put the future of humanity at extreme risk. Global heating is already resulting in more extreme weather events at greater frequency, and some irreversible changes have now been triggered in our climate systems as tipping points are exceeded.*
- *“The first such tipping point is the Arctic Circle region. This region is warming four times faster than the global average, resulting in rapid and irreversible sea ice loss, and ice loss from the Greenland ice sheet. Arctic Sea ice loss is accelerating global warming via the reduction in albedo as the blue sea absorbs the sunlight, rather than ice reflecting the sun’s heat back out into space. Ice loss from the Greenland ice sheet is accelerating sea level rise, and is now irreversible. In addition, the Arctic region holds vast amounts of methane, a powerful greenhouse gas, locked within permafrost, which is now starting to thaw, with potentially disastrous consequences.”*

Sir David King (Chief Scientific Advisor to the UK Govt 2000-2007) **2022**

A few warm-up exercises (3)

- *Journalists, then scientists, but not many politicians...* (Caroline Lucas fighting alone under FPTP)
- *“We should abandon the illusion that our politicians will come to the rescue of planet Earth, especially those who delight in calling themselves climate leaders. Time and again they have betrayed the faith that has been placed in them – using greenwashing and PR strategies disguised as politics.*

But

- *“We cannot despair... A critical mass of people ... will no longer tolerate the procrastination, denial and complacency... It is not too late. We have a duty to help as many of our fellow citizens as possible understand the dire situation we are in. We must all do more to explain, inform and educate; public pressure can create profound change.”*

Greta Thunberg **Oct** 2022

<https://www.newstatesman.com/environment/2022/10/greta-thunberg-guest-edit-politicians-rescue-planet>

And

“It always seems impossible, until it’s done.”

Nelson Mandela

Course Summary

1. Framing Climate Change

- What is it, where does it sit in relation to other issues, what are the inter-actions, why is it important?

2. The Key Systems

- The Planetary Climate System
- Socio-Political Systems - The central importance of Fairness
- Economic Systems - Can capitalism do it?

3. Evidence, Tipping Points, New Tech and Projections

4. Key Players, and Psychology

5. Misinformation

6. What Humankind needs to do, and What to do (personal)

7. What to do (Group)

8. Tools, Q&A and Plans

What is the “Climate Change” issue?

- Objective science
 1. The planet *is* warming up
 2. Rising CO₂ levels *are the cause of* planetary warming
 3. *Humans* are *the* major cause of the observed warming
 4. Burning Fossil Fuels *is* the main reason
- Sociopolitical impacts
 - Social – habitability/migration, food scarcity, water wars
 - Political – nationalism (even fascism), ever more rot (from ever more lying)
 - Economic – cracks (disruption, resource scarcity), implosion (systemic contagion)
 - And embracing all of these: Fairness – Injustice *rots* the SPE fabric.
- Inter-related crises
 - Sea-level rise
 - Bio-diversity loss → collapse
 - Pollution.. Etc etc
- Options / choices
 - Not all is lost *yet*
 - But this is *all-pervasive*, and *urgent*

What is the “Climate Change” issue?

- ‘Climate Change’ sounds not too bad
 - We all love a nice *climate*, and often *change* is good.
- Climate Change is a neutral term, but really we should be thinking in terms of
 - Climate *Breakdown* (where the weather gets more turbulent, and regular weather patterns break down – gulf stream, el nino, monsoon, etc)
 - Climate *Emergency*
 - Climate *Crisis*
 - Even *Extinction*
- I think my preferred term is...
 - **Crisis** (pure and simple)
 - Because it’s not just the climate

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Inter-related Crises

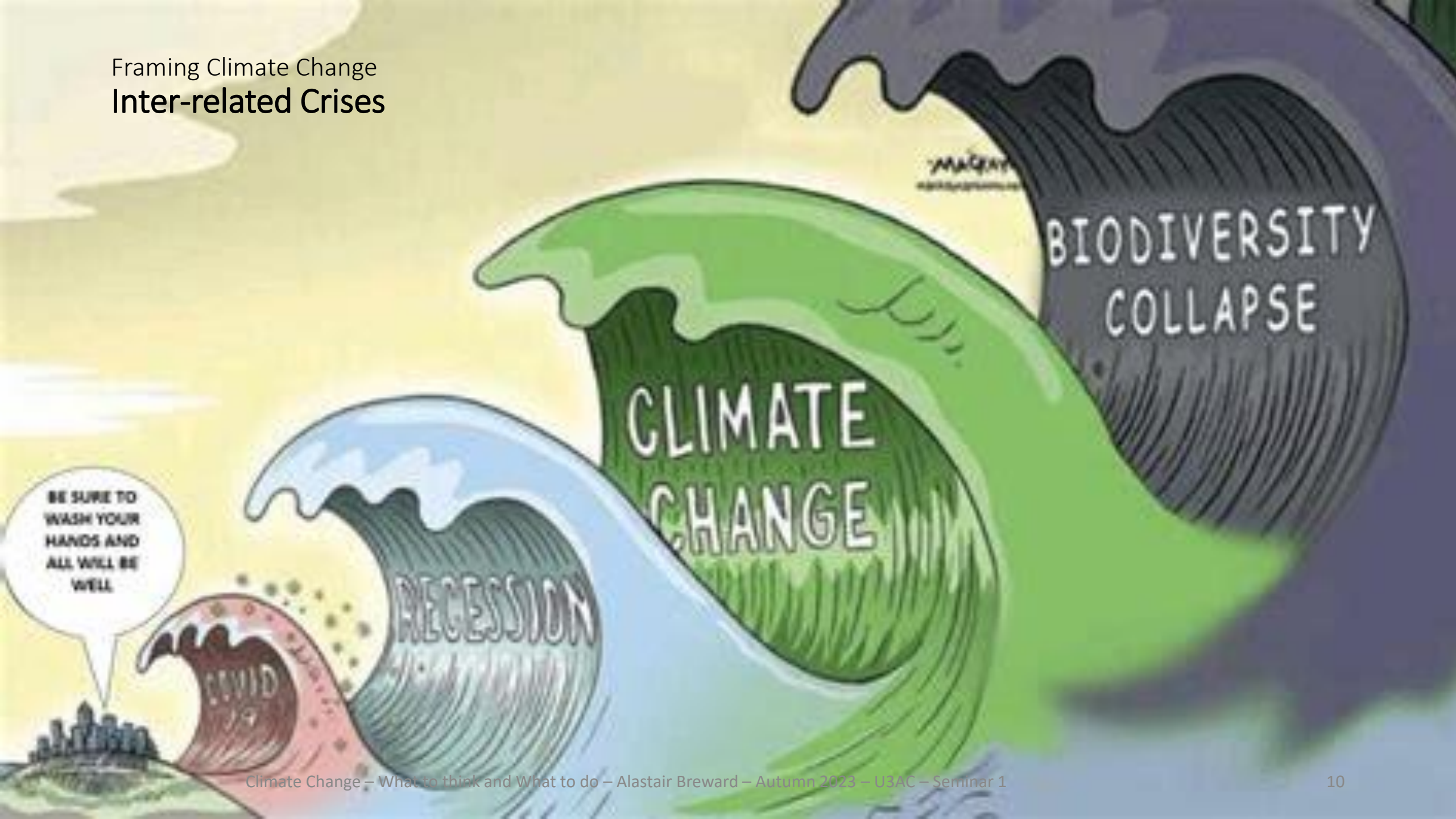
Global Warming from Fossil Fuels links to....

- Deforestation
- Sea Level rise / melting icecaps (feed back via Albedo)
- Ocean warming and acidification
- Food Waste
- Food/Water insecurity
- Agricultural profligacy - land, soil (erosion), fresh water, fertilizers, pollution
- (Human) population growth
- Consumer culture / Fast Fashion / Planned Obsolescence
- Chemical / Plastic Pollution
- Air pollution

All of which cause

- Biodiversity Loss (and if we carry on, *Collapse*, which WILL destroy us...)

Framing Climate Change Inter-related Crises



Framing Climate Change Inter-related Crises

But it's not just the environmental impacts....

In a perverse and highly damaging way, CC also links (*causally in both directions*) to

- Poor Governance
 - market failures/poor price signals/externalities/current pricing of future effects
 - due to Govts failure to update legislation - it worked OK before we got addicted to Fossil Fuels, now their inaction is disastrous
- Political *mendacity*, and straight forward *corruption*

And finally to

- Injustice
 - do we believe in fairness? Or is it Dog-eat-Dog?
 - Can WE thrive in a chaotic , violent world? (More in next seminar)

Climate breakdown impacts – society, security, technology

- Reduced social cohesion
 - dog-eat-dog international economic and trade policies
 - trade barriers especially re food
 - human migration (intrastate *and* international), *permanent* refugees – in the *billions*
 - epidemics from infectious diseases
 - inequalities (rural and small farming, the economically dependent, the poorest everywhere)
- Reduced security
 - international water and resource wars
 - civil wars, as ‘facts on the ground’ change
- Changed priorities in
 - fundamental research
 - R&D
 - tech transfers / collaborations?

towards sustainables, weather manipulation, food tech
but also.. cybersecurity, weapons, barriers

*“Resource scarcity and environmental change increase the **risk of conflict**”* Fetzek & Mazo - Climate, Scarcity and Conflict 2014

*“For every 1% rise in average temperature and drop in average rainfall, **violent conflict between neighboring states** rises 4%, while **violent conflict between groups within states** climbs 14%. Scholars foresee new shipping routes opening up as the Arctic ice cap shrinks, potentially leading to **military conflicts**.”* The Brookings Institute

*“Climate change of the magnitude and time frames projected by the world's leading climate scientists poses fundamental questions of **human security, survival** and the **stability of nation states**.”*
Alan Dupont - The Strategic Implications of Climate Change 2008

Categories

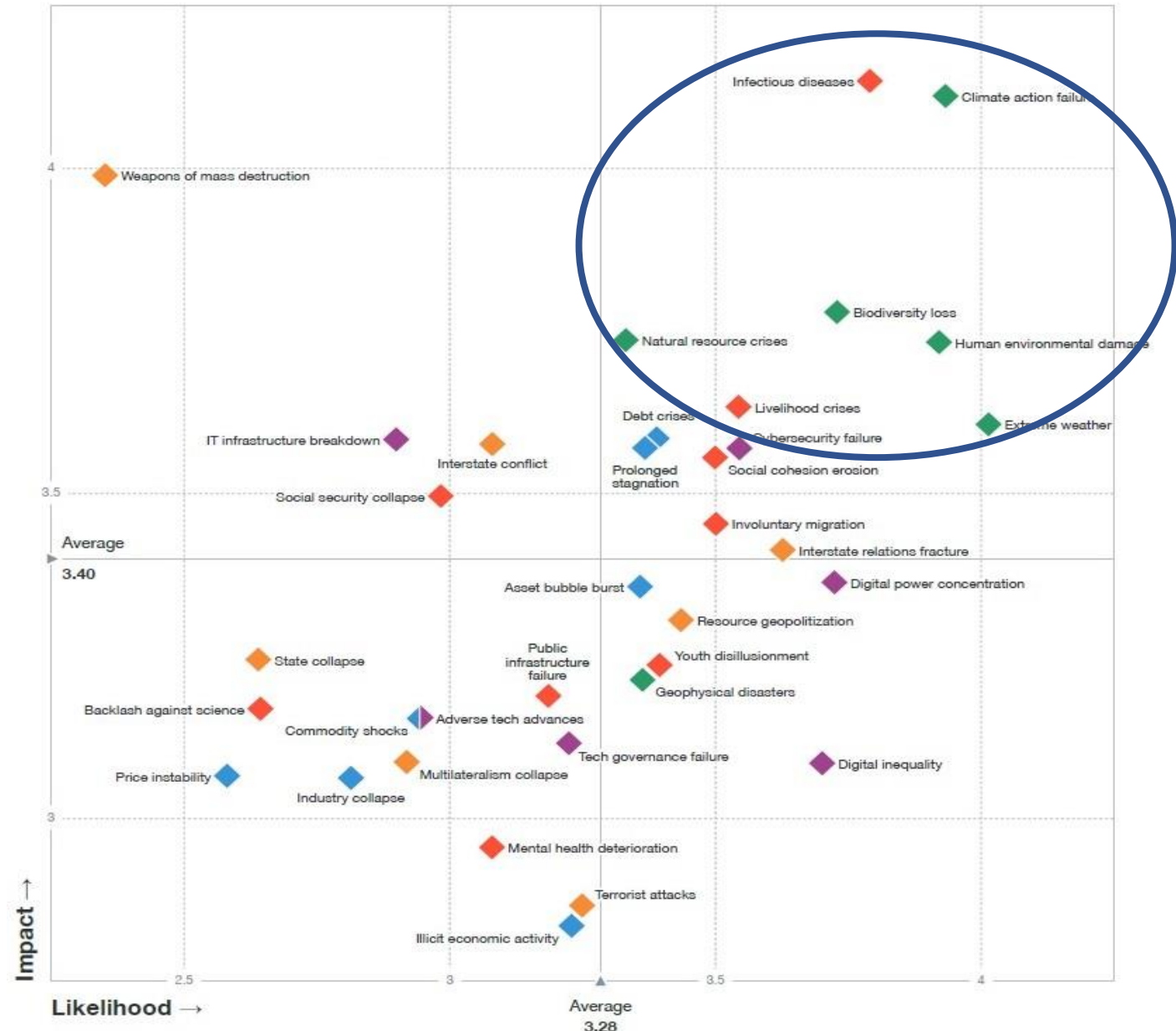
- ◆ Economic
- ◆ Environmental
- ◆ Geopolitical
- ◆ Societal
- ◆ Technological

Top Risks by impact

- ◆ 1 Infectious diseases
- ◆ 2 Climate action failure
- ◆ 3 Weapons of mass destruction
- ◆ 4 Biodiversity loss
- ◆ 5 Natural resource crises
- ◆ 6 Human environmental damage
- ◆ 7 Livelihood crises
- ◆ 8 Extreme weather
- ◆ 9 Debt crises
- ◆ 10 IT infrastructure breakdown

Global Risks Landscape

How do respondents perceive the impact ↑ and likelihood → of global risks?



Source:
World
Economic
Forum
Global Risks
Perception
Survey
2020-2021

NB: READ ←
RIGHT TO LEFT

FIGURE III

Global Risks Effects

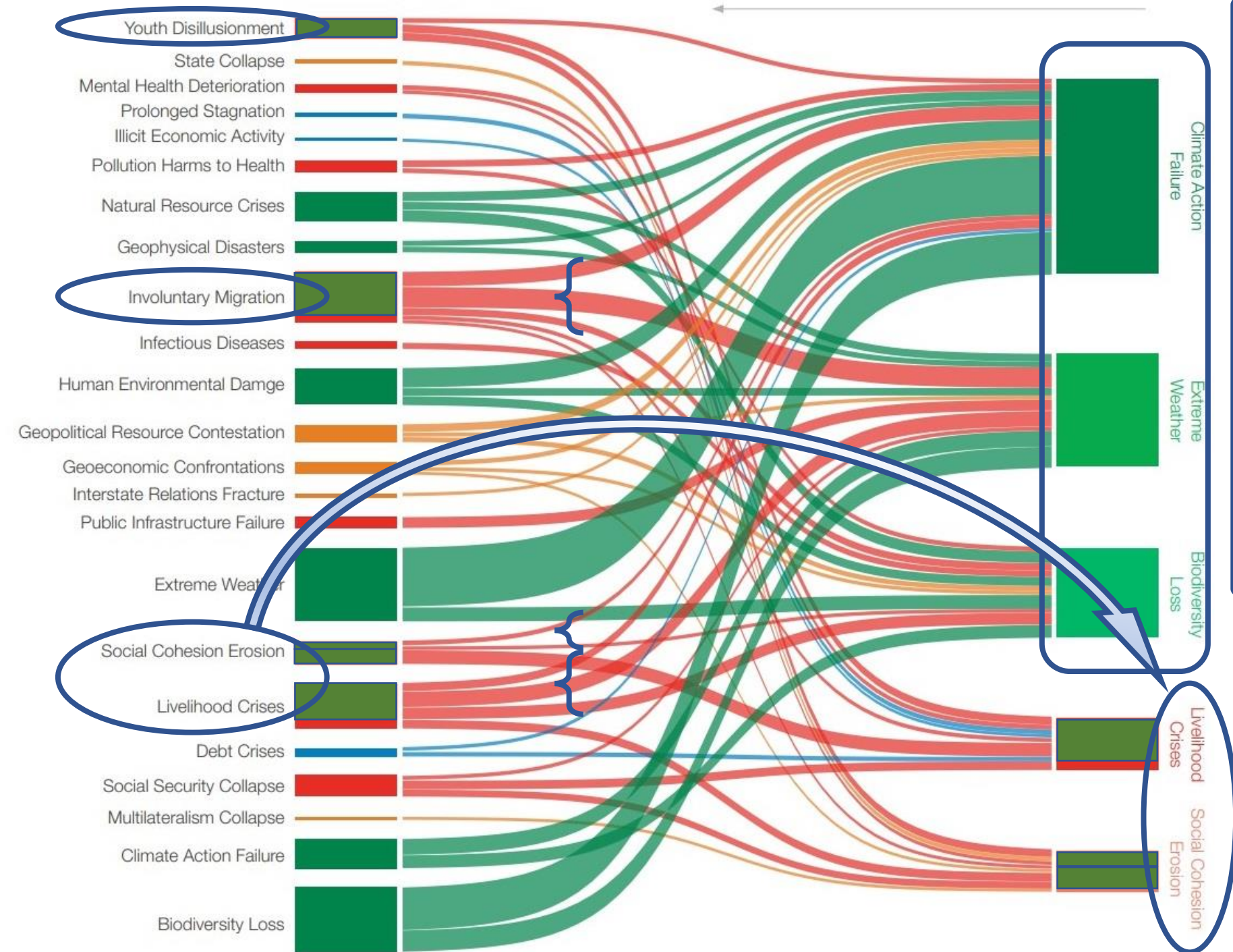
Most potentially damaging risks (top row) and risks they will aggravate (bottom row)*



Global Risks

- In 5 categories
- Top 3 are Green
- But look at their effects on, e.g., ...
 - Migration
 - (green too)
 - Social Cohesion
 - Livelihood
 - Also Greenish!
- But these last 2 are themselves in the TOP 5 Risks!
- Feedback takes them almost fully Green
- So others follow
 - Eg Youth disillusionment

So, there is just ONE
“mother of all risks”



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A big (related) issue

Liberal Democracy

- Illiberal Leaders
 - for Life.... Putin, Xi Jing Pin
 - for the ill-educated.... Trump
 - other strongmen... Bolsonaro (despatched for now), Erdogan, Modi, Kim
- Undemocratic Systems
 - Cambridge Analytica, Facebook , silos, dark ads (i.e. invisible lies)
 - 200 FB 'likes' tell CA enough to know (i.e. predict) you better than anyone except spouse
 - powerful non-democracies (China)
 - *sham* democracies (Russia for sure, ..)
 - FPTP in UK, Electoral College in US
- Wealth concentration – inexorably getting worse
- International institutions under attack
 - EU via Brexit, AfD, Le Pen, Melone, Orban, Fico in Slovakia (though recent positive news in Poland...)
 - UN, WHO, etc via Trumpism, Russian invasion of Ukraine
- And generally, tensions in West as China/India return to being the “centre of the world”
 - Polarising conflicts like Israel/Palestine
- All of these cut BOTH ways – CC feeds them, and they feed CC inaction

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The case for caution with our planet

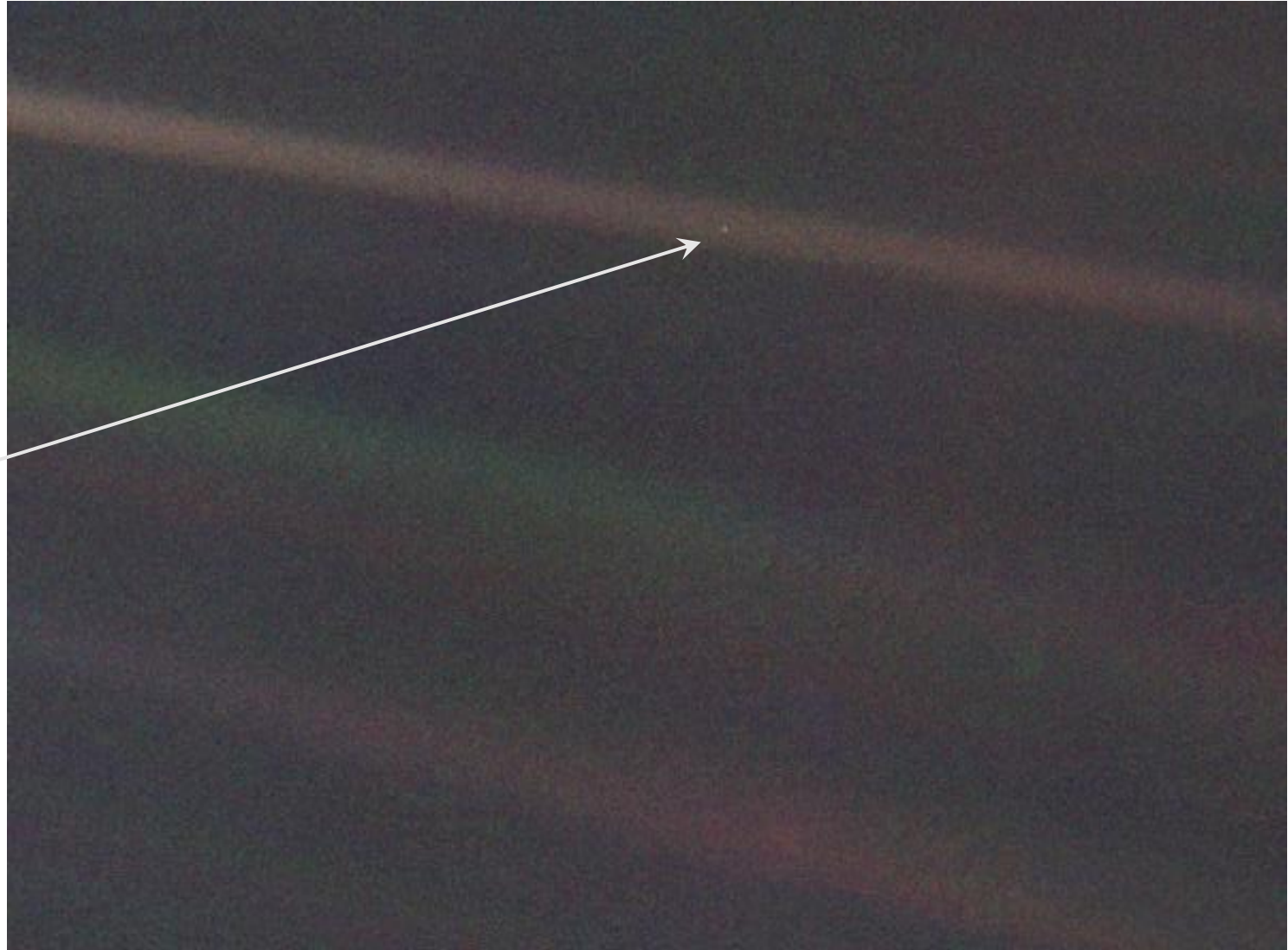
Let's stand further back

- Geocentricity – where do we fit in space
- Human Time – where do we fit in time
 - Are we unique in the Universe?
 - Are we in good shape?

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Our place in space

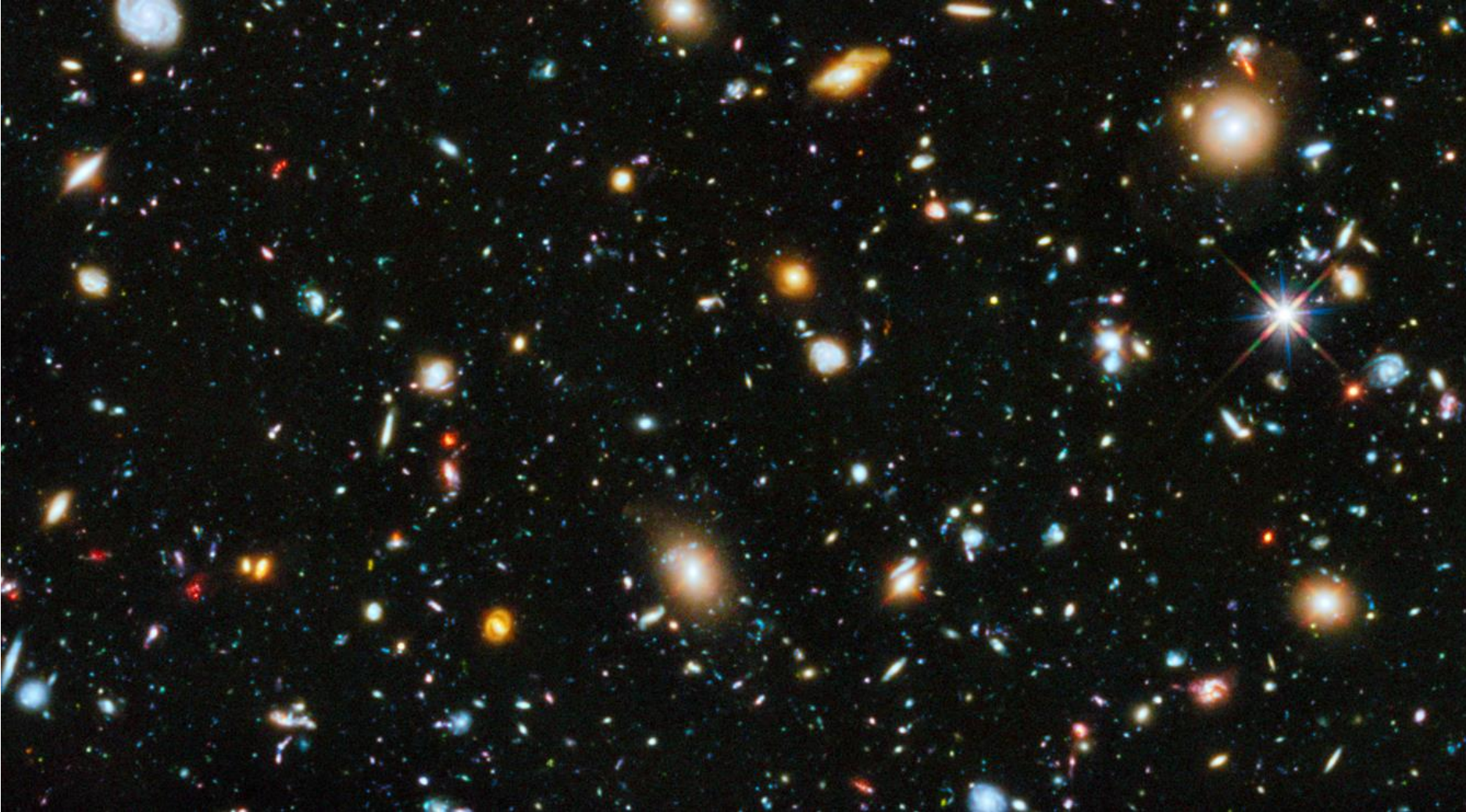
- If the Sun is a soccer ball...
 - Earth is a pin head
 - 23m away (a cricket pitch)
 - So we see the Sun, but the Sun doesn't really see us
 - Its "Solar System" extends almost a km beyond us
- Earth – the "Pale Blue Dot"
February 14, 1990, from *Voyager 1*
from 3.7 billion miles away (Taken at request of Carl Sagan. The bands are sunlight reflected by the camera.)
- That's about 6 light *hours*, about 1/1,500 of a light year. Milky Way diameter is 50 million times this!



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Our place in space

And the Milky Way is just one of about 100,000,000,000 (some now think 1 trillion...) galaxies



Our place in time

- Big Bang: 13,800,000,000 years
- Earth: 4,500,000,000 years
- Civilisation: 12,000 years (In universe time, the last mm of 1 Km)
- If Earth's life were a week (ending with Sunday)
 - we modern humans arrived on Sunday at *11:57:30 pm* (200,000 years)
 - we settled down at *9 seconds before midnight* (12,000 years)
 - the year 2,100 AD is *6/100ths of a second away...*
 - will we make it?
- This is what the last coefficient in the Drake equation is for!
 - The equation aims to calculate the number of advanced civilisations out there in communications range

Drake Equation (Wikipedia)

$$N = R^* \cdot f_p \cdot n_e \cdot f_\ell \cdot f_i \cdot f_c \cdot L$$

where:

N = the number of **civilizations** in our galaxy with which communication might be possible;

and

R^* = the average rate of **star** formation per year in **our galaxy**

f_p = the fraction of those stars that have **planets**

n_e = the average number of planets that can potentially support **life** per star that has planets

f_ℓ = the fraction of the above that actually go on to develop life at some point

f_i = the fraction of the above that actually go on to develop **intelligent** life

f_c = the fraction of civilizations that develop a technology that releases detectable signs of their existence into space

L = the length of time for which such civilizations release detectable signals into space

.....BEFORE THEY SELF-DESTRUCT!

Thus far, we've got *our* "L" to about 100 years. Are we near the end?

On the plus side, the Universe may be teeming with life.

But no-one in range will ride to our rescue, ever.

Our habitable zone in space-time

- The entire biosphere (zone with *any* life, from the deepest ocean to the highest floating microbe)...
- Is like the skin on an apple.



- So we go extinct if we screw up this zone. (And we are, fast.)

A range of positions on CC

- Various stances:
 1. It's all nonsense
 2. It's an issue but overblown, e.g. tech will get us through
 3. It's pretty important, but I am powerless
 4. It's very serious, and we've a lot of work to do
 5. It's super-serious, but it's too late.
- I won't be spending much time on positions 1, or 2 (partly because there is so much scope for using 2 cynically, to undermine 4!)
- I won't be doing 'both sides' or 'who knows!'
 - Because we *do* know, and there's only one respectable position now (which is 4).
- Most people are now in 3 – and it's wrong. The point of this course is to convince you that there are still lots of things you can and must do both as an individual and as a group.
- 5 is also wrong. We are not in the territory of *stopping* the climate crisis (it's already too late) but there is lots of scope for averting the worst outcomes.
- Given that it IS very serious and there ARE lots of things we can do, how come we aren't doing them? We will also cover this.

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The Short version of this course

- It is NOT too late
- There is a continuum, and some really bad outcomes are already baked in, due to our inertia
- BUT
- We will ensure FAR worse outcomes if we keep rearranging deck-chairs
- So action is urgent
- Sometimes we hear a debate in terms of
 - “should we do X, or is Y better?”
 - “we should do X, but right now we have a bigger issue”
 - “we could do X, but unless *they* do X too, it’s pointless”

The truth is

- *everyone*
- needs to be energetic about doing *all they can*,
- *now*.
- No-one is riding to our rescue, least of all our Govts.
- There are powerful entrenched forces opposing what needs to be done.
- If you want to be part of the problem, rather than part of the solution, look away now...

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Sneak Peak ahead..

- Preview of “What to Do” – to save a few weeks!
 - Decarbonise your investments (SINGLE BIGGEST IMPACT personal action, maybe lucrative too)
 - Don't Fly
 - If you must, offset (but nb. *most* offsetting is useless – take the trouble to do it right – see Resources at end.)
 - Cut down on/cut out Meat (especially beef/lamb), then dairy
 - ‘Beyond’ meat, Magnum vegan ice-creams, ...
 - Drop Home heating 1 degree C – woolly hat indoors!
 - Investigate heat-pumps (not yet right for everyone)
 - Reduce Consumption generally
 - the best device is the one you already own
 - wash everything less, with fewer products
 - Buy (almost) everything second hand. Recycle don't discard.
- But the most important things are about *collective* action...
 - *Talk* to people, a lot, repeatedly – see guides on reading list (we will revisit near the end)
 - Find others, and *collaborate* to:
 - Gather information (as you are doing right now!)
 - Write to people with power (e.g. your MP), and say:
 - Your next vote will be ONLY on Climate issues, tired of fence-sitting & platitudes, needs guts & sweeping changes
 - See <https://www.thecommitment.uk/> which does this for you
 - Support people protesting, even think about protesting yourself.

- You don't have to glue yourself to a railway line...
- You can be quite British about it.
(well, Irish, but you know what I mean)



GreenPeace door-knocking

- “We’re going to go door-to-door to recruit climate voters - we’ll get people to cast their vote for climate and put up posters in their windows - making climate voters a real presence in communities.
- This will put huge pressure on politicians seeking election and force the next government to take serious climate action.”
- [Greenpeace Event: Halloween door-knocking – Cambridge](#)
 - **WHEN:** Saturday 28 October 2pm-5pm. **Please arrive at 1.30pm to 1.45pm for a prompt start at 2pm**
 - **WHERE:** Anglia Ruskin University on East Road CB1 1PT. Meet on the ground floor at ‘the eatery’, just inside the East Road entrance

Climate Change – What to think and what to do

Resources (selected – there are so many resources in multiple formats) - 1

Overview on urgency

- Greta Thunberg – *The Climate Book 2022*
- George Monbiot – *This can't be happening 2021* (collected essays – short little book)

The economic perspective

- Naomi Klein – *This changes everything 2014*
- Kate Raworth – *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist 2017*
- Tim Jackson – *Prosperity without Growth (2nd ed) 2017*
- Adrienne Buller - *The Value of a Whale: On the Illusions of Green Capitalism* (or listen to AB in discussion with Grace Blakeley, as part of her “A World to Win” series) - [Is Green Capitalism Possible?](https://podcastaddict.com/episode/143603961) (<https://podcastaddict.com/episode/143603961>)
- James Marriott and Terry Macalister – *Crude Britannia 2021: How Oil Shaped a Nation* (on links between Big Oil and Power Elites)

What to do

- Jonathon Porritt – *Hope in Hell 2020*
- Mike Berners-Lee – *There Is No Planet B: A Handbook for the Make or Break Years 2021* (also: *How Bad Are Bananas?: The carbon footprint of everything - 2020 new edition*)
- Roman Krznaric - *The Good Ancestor: How to Think Long Term in a Short-Term World 2021* (also a TED talk video)
- Sarah Bridle – *Food and Climate Change without the hot air 2020*
- [ThirdAct.org - Resources Archive](https://thirdact.org/resources) (thirdact.org is squarely aimed at those aged over 60 - US site, but lots of useful guidance – e.g.
 - [Banks Pledge Toolkit](#), about rejigging your finances)
- Thread by @ThierryAaron “What can we do?” (<https://threadreaderapp.com/thread/1590329428030021632.html>)
- [Make My Money Matter - your pension is powerful](#) – initiative about pension switching, claiming that doing this is doing 21x more than stopping flying, going veggie and switching energy supplier, combined!

Climate Change – What to think and what to do

Resources (selected – there are so many resources in multiple formats) - 2

Information resources to share

- With those who think there's still a debate to be had:
 - [Bill Nye to Climate Change Deniers: You Can't Ignore Facts Forever | Big Think](#) (from c 2013, still true)
- With those who think "It won't be too bad":
 - [\(82\) Earth at 2° hotter will be horrific. Now here's what 4° will look like. | David Wallace-Wells – YouTube](#)

Guides on talking to people effectively

- <https://climateoutreach.org/reports/how-to-have-a-climate-change-conversation-talking-climate/>
- *Speak up for the planet - Your guide to having climate change conversations* (from ClientEarth.org – you have to register to receive PDF)
- Or if you're going to do a lot of this, consider: [Have the Talk: Climate Conversations | NOAA Climate.gov](#)
(<https://www.climate.gov/teaching/resources/have-talk-climate-conversations>)

Novels

- Kim Stanley Robinson - *The Ministry for the Future* ("a must-read for anyone worried about the future of the planet" Publishers Weekly starred review)
- Ned Beaman - *Venomous Lumpsucker* (humorous sci-fi)

Movies

- A discussion of relevant best films: https://twitter.com/david_ho/status/1597351474517770240?s=12&t=UwQsyKmeQd4_gBO7aCRp-Q
 - Or here if you're not on Twitter: [What's the best film about climate change? by @ david_ho \(David Ho\) \(twitter-thread.com\)](#)
 - *About 100 films, many just set in dystopian futures, but here are some:*
- | | |
|---------------------------------|--|
| <u>"Fiction"</u> | <u>Documentaries (all on BBC iPlayer or Channel 4)</u> |
| • <i>An Inconvenient Truth</i> | • <i>The Oil Machine</i> |
| • <i>Don't look up</i> | • <i>A Life on Our Planet (David Attenborough)</i> |
| • <i>The Age of Stupid</i> | • <i>Climate Change - The facts (David Attenborough)</i> |
| • <i>The Day after Tomorrow</i> | • <i>Is it time to break the law? (Chris Packham)</i> |

Climate Change – What to think and what to do

Resources (selected – there are so many resources in multiple formats) - 3

- IPCC Reports
 - <https://www.ipcc.ch/report/sixth-assessment-report-cycle/>
 - This link gets you to all the sub-reports
- The IPCC is currently in its Sixth Assessment cycle, during which the IPCC will produce
 - the Assessment reports of its three Working Groups
 - WGI – The Physical Science Basis
 - WGII – Impacts, Adaptation and Vulnerability
 - WGIII – Mitigation of Climate Change
 - three Special Reports
 - Global Warming of 1.5°C
 - Climate Change and Land
 - The Ocean and Cryosphere in a Changing Climate
 - a refinement to the methodology report
 - the Synthesis Report - the last of the AR6 products - [AR6 Synthesis Report: Climate Change 2023 \(ipcc.ch\)](https://www.ipcc.ch/report/sixth-assessment-report-cycle/synthesis-report/)
- The Synthesis Report (SYR):
 - synthesises and integrates materials contained within the Assessment Reports and Special Reports
 - is written in a non-technical style suitable for policymakers
 - addresses a broad range of policy-relevant but policy-neutral questions approved by the Panel
 - in two parts
 - a Summary for Policymakers (SPM) of 5 to 10 pages
 - a Longer Report of 30 to 50 pages.

Climate Change – What to think and what to do

Resources (selected – there are so many resources in multiple formats) - 4

- Information Websites

- [DeSmog](#) – “founded in January 2006 to clear the PR pollution that is clouding the science and solutions to climate change. Our team quickly became the world’s number one source for accurate, fact-based information regarding global warming misinformation campaigns.”
- [InfluenceMap Home](#) – “an independent think tank producing data-driven analysis on how business and finance are impacting the climate crisis”
- To offset the carbon from unavoidable flights: [Atmosfair.de/en/](#) – “a German non-profit organization that actively contributes to CO₂ mitigation by promoting, developing and financing renewable energies in over 15 countries worldwide”
 - Calculate Offset required here: [Act Now! - atmosfair](#)
 - Choose project to fund here: [Project overview – atmosfair](#) or here: [Projects – Gold Standard Marketplace](#)

- Cause and Activist Websites

- Too many to list – see seminar 7 (mainly)
- But <https://www.thecommitment.uk/> is an easy one. By signing up you commit to vote in the next GE based on who you feel will work for urgent action on the climate and nature, giving your particular concerns/reasons. They collate (first names and reasons) and forward to the relevant candidates. Not partisan.